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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PATEL, ISHWARBHAI B

ART UNIT PAPER NUMBER

2841

DATE MAILED: 10/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/759,018

Applicant(s)

KLINE, ERIC VANCE

Examiner

Ishwar (I. B.) Patel

Art Unit

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 1-3 and 14-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1. Pursuant to further review after receipt of the appeals brief filed on August 11, 2006, examiner has discovered that, while the arguments are not persuasive, there is a great deal of confusion in understanding the previous final action, as page number, line number, pointing to the specific detail in the applied prior were missing. The rejection of the applied prior art has further become more confused with the after final telephonic interview initiated by the applicant. Therefore, PROSECUTION IS HEREBY REOPENED. The previous final action has been withdrawn herewith. A new final rejection with the same rejection criteria and same prior arts, but with the details of page number, line number, is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

- (1) file a reply under 37 CFR 1.111 (if this office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,
- (2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Objections

2. Claims 9 and 12 objected to because of the following informalities:

Regarding claim 9: The recitation "said composition is said organic package" is unclear. Claim 9 depend upon claim 6, which recites the electronic device further comprising a package. Claims 9 further recites said package comprises an organic package and wherein said composition is said organic package. For the examination purpose the limitation "said composition is said organic package", is considered as one of the element of the package, i.e. one of the circuit board in the package which is made up of the composition is an organic package, which a person of ordinary skill in the art would have considered.

Regarding claim 12: The recitation "said composition is said printed circuit board" is unclear. For the examination the limitation "said composition is said printed circuit board", is considered as a circuit board is made up of the composition, which a person of ordinary skill in the art would have considered.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 4 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Berger, (US Patent No. 4,030,948).

Regarding claim 4, Berger discloses an electronic device having an integrated circuit (semiconductor element 10, figure 1 and 2) with a composition, said composition comprising: a matrix material (composition, column 34, line 34-35); a polymer which serves as an insoluble and an immobile phase in said matrix material (polyimide particles in the composition are immobile in said composition as the composition is stable with those particles in the composition); and a chelating agent (amines, described in detail on column 5, line 1 to column 8, line 33) which is bonded to said insoluble and immobile phase (as the composition exist as a single material in stable condition, which can be used as a coating material, column 4, line 35-40, all the elements thereof are bonded together).

Regarding claim 5, Berger further discloses said composition is a scratch coat (34, figure 1 and 2) covering an active surface of said integrated circuit.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raiser (US Patent No. 6,700,209) in view of Berger, (US Patent No. 4,030,948).

Regarding claim 4, Raiser in figure 1 discloses an electronic device having an integrated circuit (12), mounted on substrate 12, along with an encapsulent (column 2, line 10-26) but fails to disclose the integrated circuit with a composition for containing metal ions, said composition comprising: a matrix material; a polymer which serves as an insoluble and an immobile phase in said matrix material and a chelating agent which is bonded to said insoluble and immobile phase.

Berger discloses an electronic device having an integrated circuit (semiconductor element 10, figure 1 and 2) with a composition, said composition comprising: a matrix material (composition, column 34, line 34-35); a polymer which serves as an insoluble and an immobile phase in said matrix material (polyimide particles in the composition are immobile in said composition as those particles are stable in the composition); and a chelating agent (amines, described in detail on column 5, line 1 to column 8, line 33) which is bonded to said insoluble and immobile phase (as the composition exist as a single material in stable condition, which can be used as a coating material, column 4, line 35-40, all the elements thereof are bonded together), in order to have a protective coating to improve the functioning of the integrated circuit and to avoid degradation of electrical properties, with various physical and chemical properties as described on column 3, line 45 to column 4, line 14.

A person of ordinary skill in the art at the time of applicant's invention would have recognized the advantage of using the composition as protective coating, in order to improve the functioning of the integrated circuit and to avoid degradation of electrical properties.

Therefore, it would have been obvious to a person ordinary skill in the art at the time of applicant's invention to provide the integrated circuit of Raiser with claimed coating compositions, as taught by Berger, in order to improve the functioning of the integrated circuit and to avoid degradation of electrical properties.

Regarding claim 5, the modified package of Raiser further discloses said composition is a scratch coat (34, figure 1 and 2 of Berger) covering an active surface of said integrated circuit.

Regarding claim 6, the modified package of Raiser discloses all the features on the claimed invention including a package (see figure 1) to which said integrated circuit is bonded, as applied to claim 1 above.

Regarding claim 7 and 8, Raiser further discloses encapsulant (24, 38) deposited substantially an entire surface of said integrated circuit and between said integrated circuit and said package, see figure 1, but, fails to disclose said encapsulant is made of said compositions.

Berger discloses the coating material with said composition as a coating material for getting the desired property to avoid undesirable degradation of electrical properties of the semiconductor device.

A person of ordinary skill in the art would have recognized the advantage of providing coating material with the composition having chelating agent to have desired property to avoid undesirable degradation of electrical properties of the semiconductor device.

Further, it has been held to be within general skill of a worker in the art to select a known material on the basis of suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the modified package of Raiser et al., with the encapsulant / underfill, as claimed in claim 7 and 8, having the composition with chelating agent to avoid undesirable degradation of electrical properties of the electronic device.

Regarding claim 9, the modified structure of Raiser et al., discloses all the features of claimed invention, as applied to claim 6 above, but fails to disclose said package comprises an organic package and wherein said composition is the said package. Raiser et al., does not disclose the details of package substrate 14 or the printed circuit board 22.

Burger, in an embodiment, figure 5, discloses a substrate made of resin, which is an organic material and the composition 160, is contained within the package.

As disclosed by Burger, the use of organic package is well known in the art, as economical and commercially available.

Further, it has been held to be within general skill of a worker in the art to select a known material on the basis of suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the package of Raiser with the one of the circuit boards made of the composition, as taught by Berger, to have the desired properties to avoid undesirable degradation of electrical properties of the semiconductor device. This meets the limitation.

Regarding claim 10, the combination of Raiser and Berger further discloses the device further comprises a printed circuit board (Raiser, 22, figure 1).

7. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raiser and Berger as applied to claim 10 above, and further in view of Ikeda (US Patent No. 5,973,930).

Regarding claim 11, the combination of Raiser et al., and Berger, discloses all the features of the claimed invention, including the printed circuit board, but fails to disclose an underfill deposited between said package and said printed circuit board.

Ikeda et al., in figure 1, discloses a semiconductor device with underfill (7) between the package and the printed circuit board (9), to disperse the stresses caused by the difference in thermal expansion, (column 4, line 4-8).

A person of ordinary skill in the art would have recognized the advantage of providing underfill between the package and the circuit board to disperse the stresses caused by the difference in thermal expansion.

Therefore, it would have been obvious to a person of ordinary skill in the art to provide the combination of Raiser et al., and Berger, with the underfill deposited between the package and the circuit board, in order to disperse the stresses caused by the difference in thermal expansion.

Regarding claim 12, the combination of Raiser, Berger and Ikeda discloses the composition is said printed circuit board, as applied to claim 9 above.

Regarding claim 13, the combination of Raiser et al., Berger and Ikeda et al., discloses the composition is a conformal coating which is deposited over said integrated circuit, said package and said printed circuit board, as applied to claims 4, 6 and 12 above.

Response to Arguments

8. Applicant's arguments filed February 1, 2005 have been fully considered but are not found to be persuasive. Applicant's main argument is that the primary reference of Berger does not disclose a matrix material containing a chelating agent bonded to an insoluble and immobile phase and coating of Berger could be attacked by the environment causing component of the coating and the chelating agent be leached out, thereby depleting the ability of the coating to complex with metal ions. This is not found to be persuasive. As applied to the claim in detail, Berger recites a composition which comprise polyimide, which are high molecular particles and the composition exist as a stable material which also can be used as a coating material (Berger, column 4, line 35-40, all the elements are bonded together). Applicant, in the specification, on page 6, line 7-12, describe the inventive composition which include very high molecular weight insoluble and immobile particle such as polymer and further recite the composition contain the metal ions in the electronic device, page 1, line 5-8. The composition of Berger has similar functions including containing the metal ions (Berger, column 3, line 45 to column 4, line 33). Therefore, Berger meets the limitations.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Amami (US Patent No. 6,429,382) recites that capturing eluted metal ions by addition of an ion-capturing agent such as ion-exchange resin or a chelating agent is known in the art, column 2, line, 28-32.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (571) 272 1933. The examiner can normally be reached on M-F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on (571) 272 1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2841

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ibp
October 27, 2006


Ishwar (I. B.) Patel
Primary Examiner